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EXAMINER

AGUSTIN, PETER VINCENT

ART UNIT PAPER NUMBER

2652

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/070,288

Applicant(s)

NAKANISHI ET AL.

Examiner

P. Agustin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11 and 16-23 is/are pending in the application.
- 4a) Of the above claim(s) 22 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 16-21 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

By

DETAILED ACTION

1. This application is a 371 of PCT/JP01/05822, filed July 4, 2001.
2. Claims 1-9, 11 & 16-23 are now pending, with claims 22 & 23 withdrawn from further consideration due to a previous restriction requirement.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 9 & 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki (US 5,608,695).

In regard to claim 1, Yamazaki discloses an optical semiconductor device (Figure 6) comprising: a laser element (29); an emitted beam dividing portion (28b) for dividing an emitted light beam from the laser element into a main beam and two sub beams (Note: Figure 2, element 8a is a grating that divides the laser beam into 0-order, +1-order & -1-order beams (see column 2, lines 1-7). Figure 6 is an improvement of Yamazaki's invention over the prior art shown in Figure 2; therefore, element 28b of Figure 6 is understood to have the same property as element 8a of Figure 2); a reflected beam dividing portion (28a) for dividing a reflected light beam from an information recording medium into light beams in different focused states; servo-signal-detecting photodetector elements (Figure 7, elements 31 & 34; column 5, line 15) for receiving the reflected light beams obtained by the division by the reflected beam dividing portion in a defocused state; and a signal-detecting photodetector element (Figure 7, elements 32 & 33) for

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receiving a reflected light beam obtained by diffracting with the emitted beam dividing portion a reflected light beam that has passed through the reflected beam dividing portion, wherein the emitted beam dividing portion includes a first diffraction grating region for generating the main beam, and second and third diffraction grating regions for generating the sub beams (the claimed regions correspond to the respective regions of element 28b that emit the 0, -1 & +1 order beams), and the signal-detecting photodetector element (Figure 7, elements 32 & 33) receives a beam that is obtained by diffracting the reflected light beam of the main beam with the reflected beam dividing portion and then diffracting an obtained zero order diffracted beam with the first diffraction grating region (note that a “main beam” is also a “zero order diffracted beam”).

In regard to claim 2, Yamazaki discloses that the first diffraction grating region is positioned between the second and third diffraction grating regions (understood from “single main beam and two sub-beams” on column 1, lines 27-28; it is known in the art that two sub-beams are arranged on opposite sides of a main beam, which suggests the claimed arrangement of diffraction grating regions), and the second and third diffraction grating regions have the same grating arrangement direction which is different from a grating arrangement direction of the first diffraction grating region (understood from the fact that the first diffraction grating region emits a 0-order light and the second and third diffraction grating regions both emit light of order 1 but with opposite powers).

In regard to claim 9, Yamazaki discloses that the first diffraction grating region is composed of a plurality of diffraction grating regions that divide a spot of the reflected light beam equally (see Figure 7, elements 35, 36, 37 & 38).

Claim 16 has limitations similar to those of claim 1; thus, it is rejected on the same basis. Furthermore, in regard to claim 16, Yamazaki discloses an optical information processing device (Figures 5 & 6) comprising: an optical system (22) for guiding the light beams obtained by the division by the emitted beam dividing portion to an information recording medium; and the information recording medium (23).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 & 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Katayama (US 6,894,958).

For a description of Yamazaki, see the rejections above. However, Yamazaki does not explicitly disclose: in regard to claim 3, that two diffracted light beams of the same order diffraction by the first diffraction grating region are subjected to the diffraction with different diffraction efficiencies, and the diffracted light beam having the higher diffraction efficiency is received by the signal-detecting photodetector element; and in regard to claim 4, that each grating in the first diffraction grating region is of an inclined type having a step-like cross-sectional shape or a triangular cross-sectional shape.

Katayama discloses: in regard to claim 3, that two diffracted light beams of the same order diffraction with different diffraction efficiencies (last three lines of abstract), and the diffracted light beam having the higher diffraction efficiency is received by a signal-detecting

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photodetector element (abstract, lines 6-8: note “data signal”); and in regard to claim 4, that each grating is of an inclined type (Figure 12) having a step-like cross-sectional shape (Figure 13A) or a triangular cross-sectional shape. It would have been obvious to one of ordinary skill in the art at the time of the invention by the Applicant to have applied the teachings of Katayama to the device of Yamazaki, the motivation being to provide an optical head apparatus capable of realizing high S/N with respect to a data signal and a tracking error signal (column 4, lines 47-54), thereby enabling accurate reproduction of data.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Opheij et al. (US 4,918,679).

For a description of Yamazaki, see the rejections above. Furthermore, in regard to claim 5, Yamazaki discloses that the first diffraction grating region is composed of gratings; however, Yamazaki is silent to whether each of the gratings is in a curved line form.

Opheij et al. disclose gratings in a curved line form (see Figures 7 & 8). It would have been obvious to one of ordinary skill in the art at the time of the invention by the Applicant to have used the curved gratings of Opheij et al. for the emitted beam dividing portion of Yamazaki, the motivation being to ensure high quality imaging of the radiation source in the scanning spot of the optical recording medium (column 3, lines 18-27).

8. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Heemskerk (US 4,665,310).

For a description of Yamazaki, see the rejections above. However, Yamazaki does not explicitly disclose: in regard to claim 6, that the first diffraction grating region is composed of a plurality of diffraction grating regions having the same diffraction efficiency; in regard to claim

7, that the first diffraction grating region is composed of at least two diffraction grating regions that differ from each other in a direction in which gratings are arranged; and in regard to claim 8, that the first diffraction grating region is composed of diffraction grating regions having the same grating periodic interval.

In regard to claims 6-8, Heemskerk discloses a diffraction grating (Figure 2) composed of a plurality of diffraction grating regions having the same diffraction efficiency (suggested by column 4, lines 10-15), composed of at least two diffraction grating regions (11 & 12) that differ from each other in a direction in which gratings are arranged (as shown in Figure 2), and composed of diffraction grating regions having the same grating periodic interval (column 3, lines 28-33). It would have been obvious to one of ordinary skill in the art at the time of the invention by the Applicant to have applied the teachings of Heemskerk to the diffraction grating of Yamazaki, the motivation being to provide a diffraction grating that is simple to manufacture (column 1, line 59; column 4, lines 27-30) and that prevents erroneous tracking and focusing (column 1, line 65; column 2, lines 1-3; column 4, lines 16-17) (see also column 2, lines 16-18).

9. Claims 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Hasegawa et al. (US 5,881,043).

For a description of Yamazaki, see the rejections above. Furthermore, Yamazaki discloses: in regard to claim 18, that a pair of the servo-signal-detecting photodetector elements (Figure 7, elements 31 & 34) are arranged symmetrically with respect to an optical axis, and the signal-detecting photodetector element (32 or 33) is arranged at a shorter distance from the optical axis than the servo-signal-detecting photodetector elements, wherein the pair of the servo-signal-detecting photodetector elements and the signal-detecting photodetector element are

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integrated (see Figure 6, element 26); in regard to claim 19, that the signal-detecting photodetector element is positioned closer to one of the servo-signal-detecting photodetector elements (see Figures 6 & 7); in regard to claim 20, that the signal-detecting photodetector element is provided in substantially a same plane as an emission point of the laser element (see Figure 6, element 29); and in regard to claim 21, that the signal-detecting photodetector element is divided into a plurality of detecting sections having substantially equal areas (see Figure 7, elements 32 & 33).

However, Yamazaki does not explicitly disclose: in regard to claims 17 & 18, that the signal-detecting photodetector element has a light-receiving area smaller than a light-receiving area of the servo-signal-detecting photodetector elements.

Hasegawa et al. disclose a signal-detecting photodetector (Figure 2, elements 3a & 3b) having a light-receiving area smaller than a light-receiving area of servo-signal-detecting photodetector elements (4a & 4b). It would have been obvious to one of ordinary skill in the art at the time of the invention by the Applicant to have applied the teachings of Hasegawa et al. to the device of Yamazaki, the motivation being to reduce the space consumption and weight of the optical device (see column 1, lines 33-45).

Allowable Subject Matter

10. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments filed December 22, 2005 have been fully considered but they are not persuasive.

a. On page 7, last paragraph, the Applicant disagrees with the Examiner's contention that "the second hologram (28b) disclosed in Figure 6 of Yamazaki and the gratings (8a) disclosed in Figure 2 of Yamazaki have the same properties, and are equivalent to the 'emitted beam dividing portion' required by claims 1 and 16" because allegedly, "it is not necessary for the second hologram (28b) to divide a laser beam from a laser into a main beam and two sub beams, as required by claim 1 and 16, since a tracking error signal is based on the diffraction of the reflected light." The Examiner disagrees.

As noted in the previous Office Action, Figure 2, element 8a (which Yamazaki disclosed as prior art, and which is also Yamazaki's own work) is a grating that divides the laser beam into 0-order, +1-order & -1-order beams (see column 2, lines 1-7). Figure 6 is an improvement of Yamazaki's own invention, i.e., the prior art shown in Figure 2; therefore, element 28b of Figure 6 is understood to have the same property as element 8a of Figure 2.

For a comparison of Figures 2 and 6 of Yamazaki, the Applicant is directed to column 2, lines 1-7, which describe (in regard to Figure 2) that the grating 8a divides the laser beam emitted by the semiconductor laser 9 into three beams (0, +1, and -1 order), and describes that the hologram pattern 8b gives the +1-order beam and -1-order beam opposite powers. Now, the Applicant is directed to column 4, lines 39-43, which describe (in regard to Figure 6) that the hologram 28a gives positive and negative powers to +1-

order diffracted beam and -1-order diffracted beam, respectively, i.e., hologram 28a has the same function as hologram 8b. While the function of the grating 28b is not explicitly stated in regard to Figure 6, it is clear to one skilled in the art that the 0, +1, and -1 order beams are divided by the grating 28b; and thereafter, the hologram 28a gives positive and negative powers to the +1 and -1 order beams which have been divided by the grating 28b.

b. Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments to claims 1 and 16 avoid such references or objections.

c. Applicant's arguments on page 8, paragraphs 1 & 2, e.g., "Yamazaki discloses a laser beam emitted by a semiconductor laser (29) that is transmitted through the first and second holograms", and "Yamazaki teaches giving diffraction beams astigmatism", fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

d. Applicant's arguments on page 8, paragraph 3 regarding the advantages achieved by the invention of claims 1 and 16 are not persuasive. The alleged advantages are irrelevant. As noted in the rejection of claims 1 and 16, Yamazaki teaches all the claimed elements. There is no structural difference between the prior art and the claimed

invention. Therefore, the claimed invention does not patentably distinguish from the prior art.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to P. Agustin whose telephone number is 571-272-7567. The examiner can normally be reached on Monday-Friday 9:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. L. Wellington can be reached on 571-272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

P. Agustin
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BRIAN E. MILLER
PRIMARY EXAMINER